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The genus *Desmatodon* in North America

R. S. WILLIAMS

(WITH PLATE II)

The work on this genus was mostly done some four or five years ago, but little has since occurred, so far as the author knows, to cause any important changes. Twelve species are here included in the genus as against thirteen in the Lesquereux & James Manual, but two of these thirteen species, *D. neomexicanus* and *D. nervosus* belong to *Tortula* while one other, *D. arenaceus*, is reduced to *D. obtusifolius*. This leaves ten of the Manual species, the two additions being *D. Sprengelii*, originally from Santo Domingo and discovered in Florida in 1916 by Dr. J. K. Small, and *D. stomatodontus* from Jalisco, Mexico.

Desmatodon Bushii Card. & Thér., from Missouri, belongs to *Tortula*, *fide* Brotherus; *D. Sartorii* (C. Müll.) Paris, from Mexico, is a *Leptodontium*; and *D. systylioides* Ren. & Card., from Newfoundland, a *Pottia*.

DESMATODON Brid. Musc. Recent. Suppl. 4: 86. 1819

Plaubelia Brid. Bryol. Univ. 1: 522. 1826.

Trichostomum § *Desmatodon* C. Müll. Syn. 1: 588. 1849.

Didymodon § *Desmatodon* Kindb. Eur. & N. Am. Bryin. 2: 273. 1897.

Dioicous or monoicous. Mostly alpine plants of medium or small size, usually growing in rather compact cushions on moist earth. Stems, mostly with central strand, simple or somewhat branching, closely leaved and more or less radiculose. Leaves erect-flexuous and appressed when dry; ovate and oblong to oblong-lanceolate or somewhat spatulate, concave, the margins flat, recurved or broadly incurved, entire or slightly serrulate in the upper part, sometimes colored or thickened, the apex mostly broadly acute, with costa vanishing below the apex, percurrent or excurrent into a short awn or elongate, nearly smooth hair-point. Costa in cross-section usually showing two or four guide-cells, one or two rows of large cells on the ventral side and on the dorsal side, a large stereid band, with outer cells more or less

differentiated. Cells of upper part of leaf mostly quadrate to hexagonal, scarcely or not elongate, obscure, densely papillose on both sides or distinct and more or less mamilllose; those of lower part of leaf, pale, smooth and elongate-hexagonal to rectangular. Perichaetial leaves usually not greatly differentiated. Seta erect, often strongly twisted. Capsule oblong to cylindric, erect or nodding and curved, with stomata mostly few, in the basal part, the columella often projecting above the rim; the lid conic to more or less beaked. Annulus compound, often persistent. Peristome densely papillose, the sixteen teeth (sometimes scarcely developed in *D. obtusifolius*) from a basilar membrane usually extending well above the annulus, mostly divided to near the base into two or three slender, erect or oblique forks, or the forks sometimes quite irregular and more or less united above. Calyptra cucullate, descending well below the lid.

Type species: *Dicranum latifolium* Hedw.

Capsule erect and symmetric or nearly so; leaf margin of one thickness of cells.

Cells of upper part of leaf more or less densely papillose with variously shaped papillae.

Leaf-margins somewhat recurved and leaves hair-pointed (except in *D. latifolius muticus* which is distinguished from *D. obtusifolius* by the leaves with margins partly flat and twice as long, 2.5–3 mm., and by the spores, 20 μ instead of 8–10 μ); the older leaves without a distinct golden-brown border.

Monoicous.

Upper leaves with blade usually 2–3 mm. long.

More or less spatulate or oblong, the upper marginal cells mostly obscure and rough with numerous papillae.

Gradually tapering from below the middle to an acute point.

Upper leaves with blade 1.5 mm., or less, long, the upper marginal cells distinct with few or no papillae.

Dioicous; blade of leaf about 2.5 mm. long.

Leaf-margins mostly strongly revolute all round and leaves not hair pointed.

Leaf-margins flat, the older leaves with a distinct, golden-brown border.

Cells of upper part of leaf never papillose, distinct, mostly mamilllose on one or both sides.

Median leaf-cells 15–20 μ and spores about 25 μ in diameter.

1. *D. latifolius*.

2. *D. suberectus*.

3. *D. Guepini*.

4. *D. plinthobius*.

5. *D. obtusifolius*.

6. *D. Porteri*.

7. *D. systilius*.

- Median leaf-cells and spores 8–10 μ , or less, in diameter.
- Leaf-cells highly mamilllose on the upper surface, mostly flat on under side, the leaves slightly serrulate toward apex.
- Leaves oblong-lanceolate, acute; costa slightly excurrent. 8. *D. Garberi*.
- Leaves oblong-linear, the apex broadly rounded or broadly acute; costa vanishing 2–3 cells below the leaf-apex. 9. *D. Sprengelii*.
- Leaf-cells mamilllose on both sides; margins of the leaf crenulate half way down or more. 10. *D. stomatodontus*.
- Capsule nodding, more or less curved; leaf-margins thickened.
- Cells of lid scarcely elongate, in erect rows. 11. *D. cernuus*.
- Cells of lid a little above the base elongate in oblique rows. 12. *D. Laureri*.

1. DESMATODON LATIFOLIUS (Hedw.) Brid. Musc. Recent.

Suppl. 4: 86. 1819

Dicranum latifolium Hedw. Descr. 1: 89. 1789.

Barbula latifolia Kindb. Eur. & N. Am. Bryin. 2: 252. 1897.

Autoicous, the male flower on a short stalk a little below the perichaetium with numerous club-shaped paraphyses surrounded by one or more broadly pointed, scarcely longer leaves: fertile plants in rather soft, green or brownish green tufts, reddish tomentose within; stems with central strand, erect, often branching, from a few mm. to 2 cm. high; upper stem-leaves more or less ovate or obovate to somewhat spatulate, the blade usually 2.5–3 mm. long and 1 mm. wide, mostly broadly acute, with costa nearly percurrent or excurrent into a terete, not quite smooth hair-point (or in var. *muticus* the hair-point lacking), the lower leaves smaller with costa vanishing below the apex; leaf-margins papillose, otherwise entire and more or less revolute on one or both sides; costa in cross-section showing mostly two large guide-cells, three or four cells nearly as large on ventral side, and on dorsal side a more or less distinct stereid band with two to four large outer cells; cells of upper part of leaf mostly square to short-rectangular, obscure with numerous round to oblong and c shaped papillae; perichaetial leaves scarcely differentiated; seta erect, twisted when dry, 1–1.5 cm. long; capsule erect, oblong to cylindrical, 1–2 mm. long; annulus of one to three rows of cells, more or less persistent; peristome golden brown, densely papillose, the basal membrane extending well above the annulus, with teeth mostly split to near the base into two or rarely three slender, erect forks, or the forks sometimes united above and slit below; lid obliquely beaked, one third to one half the length of the rest of

the capsule, the cells near the base not elongate, those further up broadly oblong, in erect rows; calyptra smooth, cucullate, descending well below the rim of capsule; spores papillose, rather irregular, the larger $20-24\mu$ in diameter. [FIG. 1.]

TYPE LOCALITY: Sweden or Lapland.

DISTRIBUTION: Greenland; Gaspé coast of Canada to Unalaska and southward to California and New Mexico.

EXSICCATAE: Aust. Musci App. 123.

ILLUSTRATION: Sull. Ic. Musc. Suppl. 23.

The var. *glacialis* Schimp. is evidently not distinct from the var. *muticus* Brid.

2. DESMATODON SUBERECTUS (Hook.) Limpr. in Rab.

Krypt.-Fl. 4¹: 651. 1889

Tortula suberecta Hook. in Drummond, Musci Am. 145. 1828.

Desmatodon obliquus B.S.G. Bryol. Eur. (18-20): Desmatodon 10. 1843.

Paroicous, the antheridia usually four or five with few, nearly filiform and somewhat longer paraphyses, in a cluster just below the archegonia: plants in rather dull green tufts with branching stems, 0.5-1 cm. high; leaves rather broadly ovate-lanceolate, the upper larger, 2-3 mm. long and 1 mm. wide, gradually tapering from below the middle to an acute apex and terminating in a nearly smooth awn usually less than 0.25 mm. long, the leaf margins crenulate-papillose and mostly recurved: costa stout, excurrent into the point, in cross-section mostly showing two large guide-cells, two rows of somewhat smaller cells on ventral side and on dorsal side a large stereid band with scarcely differentiated outer cells; cells in upper part of leaf from square to hexagonal, $12-16\mu$ in diameter, usually obscure with numerous, minute, often C-shaped papillae on both sides, those of lower part smooth, pale, mostly rectangular; perichaetial leaves scarcely differentiated; seta up to 18 mm. long; capsule oblong-cylindric, mostly slightly curved and nodding, about 2 mm. long without lid, the stomata in two rows near the base; annulus of one or two rows of small, persistent cells; peristome teeth sixteen, usually divided to near the base into two or three slender, papillose forks, or sometimes the forks more or less united, mostly twisted about half way round, from a basilar membrane extending well above the annulus and composed of very elongate cells with thick, projecting walls; lid high-conic, the cells just above the base elongate in very oblique rows; calyptra extending about half way down the capsule; spores rough, up to about 22μ in diameter. [FIG. 2.]

TYPE LOCALITY: Rocky Mountains of British America.

DISTRIBUTION: Greenland; Beechey Island, Arctic America; the Canadian Rockies; also in Europe.

EXSICCATAE: Drummond, Musci Am. 145.

ILLUSTRATION: B.S.G. Bryol. Eur. *pl.* 136.

3. DESMATODON GUEPINI B.S.G. Bryol. Eur. (18-20): Desmatodon 8. 1843

Trichostomum Guepini C. Müll. Syn. 1: 590. 1849.

Barbula Guepini Schimp. Syn. ed. 2, 197. 1876.

Tortula Guepini Broth. in E. & P. Nat. Pfl. 1³: 430. 1902.

Autoicous, the two or three very small male flowers scattered along the stem and composed of four or five pale, ecostate, ovate, acute leaves, smooth or nearly so, the outer longer ones about 0.5 mm. long, enclosing three or four antheridia about 0.25 mm. long, with few or no paraphyses: fertile plants rather loosely caespitose, bud-like, 1-3 mm. high; the larger upper leaves ovate to somewhat spatulate, with blade 1-1.5 mm. long, the apex somewhat rounded or acute, the margins entire and revolute from near the apex almost to base and the costa mostly smooth on the back, excurrent into a nearly smooth point one fifth to one half the length of the blade; costa in cross-section showing mostly two guide-cells, four or five cells of about the same size in one row on the ventral side and on the dorsal side a thick stereid band with outer cells differentiated; leaf-cells rather obscure and densely papillose in upper part of leaf, more or less four to six sided, not or scarcely elongate, 14-16 μ wide, those of basal part smooth, pale, larger, more or less rectangular: outer perichaetial leaves not differentiated, the inner small, acutely pointed, with flat margins; seta erect, about 8 mm. long; capsule erect, oblong-cylindric, 1-1.5 mm. long without lid, the stomata in one row near the base; annulus narrow, persistent, of one or two rows of cells; peristome pale, densely papillose, of sixteen slightly oblique, narrow teeth mostly divided nearly to the base into two filiform forks from a basilar membrane extending well above the annulus; lid high-conic, its height about twice the basal diameter, the cells a little above the base elongate in nearly erect rows; spores nearly smooth, the larger 16 μ in diameter; calyptra cucullate, descending about half way down the capsule. [FIG. 3.]

TYPE LOCALITY: France.

DISTRIBUTION: California and France.

ILLUSTRATION: B.S.G. Bryol. Eur. *pl.* 133.

4. DESMATODON PLINTHOBIUS Sull. & Lesq. Musci Bor. Am. 94.
1856

Desmatodon neomexicanus Sull. & Lesq. Musci Bor. Am. 95.
1856.

Dioicous, the male plants very similar to, and mixed with, the fertile tufts, the flowers terminal or lateral by innovations from just below the apex; the inner perigonal leaves short, acute, with pale, smooth cells extending two thirds way up the leaf, the antheridia often numerous, about 0.33 mm. long, with abundant, filiform paraphyses: fertile plants in compact cushions, with somewhat branching stems, 3–4 mm. or rarely 1 cm. high; leaves incurved-imbricate when dry, erect-spreading when moist, from oblong-lanceolate to narrowly lingulate with apex acute or rounded, those on lower stem with blade less than 1 mm. long with short point, on upper stem the blade up to 2.5 mm. long with a flexuous, smooth hair-point often of nearly equal length, the margins entire and mostly revolute from near the apex to below the middle; costa papillose on the back in upper part of leaf, in cross-section showing about four guide-cells with one or sometimes two rows of cells nearly as large on ventral side and on dorsal side a large stereid band with outer cells scarcely differentiated; cells of upper part of leaf obscure, somewhat four-sided, not elongate, about 8μ wide, covered on both sides with very small, irregular, often C-shaped papillae, those of lower part rectangular, pale, smooth, up to 16μ wide by 40μ long; perichaetial leaves scarcely differentiated; seta erect, 6–12 mm. long; capsule oblong to nearly cylindric, erect, up to 3 mm. long without lid; the lid rather obtusely high-conic, 0.5–0.7 mm. long, the two or three basal rows of cells not elongate, those about one third above the base two or three times longer than wide, in slightly oblique rows; peristome teeth pale, densely papillose, erect, mostly very irregular, sometimes scarcely projecting above the annulus, or longer and quite regularly divided into two forks from a low basilar membrane; annulus large, two or three rows of cells in height; calyptra cucullate, long-beaked, descending about half way down the capsule; spores smooth, about 8μ in diameter. [FIG. 4.]

TYPE LOCALITY: Charleston, South Carolina.

DISTRIBUTION: Pennsylvania to Alabama and westward to Missouri and Texas.

EXSICCATAE: Sull. & Lesq. Musci Bor. Am. 94, 95 (as *D. neomexicanus*) and ed. 2, 123; Aust. Musci App. 493.

ILLUSTRATION: Sull. Ic. Musc. pl. 30.

5. DESMATODON OBTUSIFOLIUS (Schwaegr.) Jur. Laubm. Oesterr. Ung. 135. 1882

Barbula obtusifolia Schwaegr. Suppl. 1: 129. 1811.

Desmatodon oblongifolius Hook. in Drummond, Musci Am. 114. 1828 (*nomen nudum*).

Tortula obtusifolia Schleich.; Broth. in E. & P. Nat. Pfl. 1³: 430. 1902.

Desmatodon arenaceus Sull. in Gray, Man. ed. 2, 628. 1856.

Desmatodon ohioense Schimp. Syn. 159. 1860.

Desmatodon subtorquescens C. Müll. & Kindb.; Macoun, Cat. Can. Pl. 6: 48. 1892 (apparently).

Didymodon arenaceus Kindb. Eur. & N. Am. Bryin. 277. 1897.

Apparently dioicous, the male plant much like the fertile but the terminal flower forming a more distinct rosette, the perigonal leaves scarcely differentiated, enclosing ten to twelve oblong antheridia 0.2 mm. long with nearly filiform, slightly longer paraphyses (the European plants are said to become autoicous by the older male stems finally bearing archegonial flowers, a condition not observed in North American specimens): plants in compact cushions, 3-4 mm. to 1 cm. high, with stems more or less branching and radiculose at the base; leaves of lower stem very small, gradually larger upward, the upper 1-1.5 mm. long and 0.25-0.5 mm. wide, oblong-lingulate, broadly acute and somewhat apiculate or rounded and blunt at apex, the margin more or less revolute nearly all round and entire or slightly crenulate in the upper part; costa stout, vanishing a little below the apex or percurrent, smooth on the back or papillose in the upper part, in cross-section showing two to four guide-cells with one or two layers of somewhat smaller cells on the ventral side and on the dorsal side mostly a distinct stereid band with outer cells slightly or not differentiated; cells in upper part of leaf mostly obscure, densely papillose with partly C-shaped papillae, more or less four-sided, about 8μ in diameter, those of lower part pale, smooth, about 12μ wide and from nearly square to two or three times longer than wide; perichaetial leaves about like those of stem, the inner sometimes smaller; seta erect, up to 1 cm. long, often strongly twisted below to the left and above to the right; capsule nearly straight and erect, 2 mm. long, with stomata in one row in the short, scarcely distinct neck; peristome variable, pale to reddish brown, finely papillose throughout, the basilar membrane extending usually a little above the rim of the capsule and either bearing slightly oblique teeth once or twice divided into slender forks of unequal

size or sometimes the teeth reduced to short irregular lobes, scarcely evident above the persistent annulus of about two rows of cells; lid high-conic or shortly beaked, the cells in slightly oblique rows and mostly elongate about half way up the lid; spores smooth, up to $10\ \mu$ in diameter; calyptra cucullate, descending to about the middle of capsule. [FIG. 5.]

TYPE LOCALITY: Switzerland.

DISTRIBUTION: New Brunswick to Vancouver Island and southward to Ohio, Missouri, Arizona, and California; also in Europe, Turkestan and Africa.

EXSICCATAE: Sull. & Lesq. Musci Bor. Am. 93, 120; Holz. Musci Acro. Bor. Am. 17.

ILLUSTRATIONS: Schwaegr. Suppl. 1: *pl.* 129; B.S.G. Bryol. Eur. *pl.* 133. Sull. Ic. Musc. *pl.* 29.

6. DESMATODON PORTERI James in Aust. Musci App. 123.

1870

Barbula subcarnifolia C. Müll. & Kindb.; Macoun, Cat. Can. Pl. 6: 52. 1892.

Dioicous, male plants rather smaller than the fertile and mixed in with them, the flowers terminal or lateral by innovations from just below the apex, with outer antheridial leaves about 1 mm. long, broadly ovate-lanceolate, acute, papillose in upper part and costate, the inner leaves much smaller, pale, smooth, enclosing quite numerous antheridia about 0.2 mm. long with nearly filiform paraphyses: fertile plants in compact tufts with stems usually 2–3 mm. high; leaves spreading, flexuous or somewhat incurved when dry, the upper about 2 mm. long, mostly broadly ovate-lanceolate, the apex acute, the margins flat and in the older leaves rather distinctly yellowish-bordered from a little below the apex to near the base with two or three rows of somewhat larger more elongate cells, less densely papillose than those within or often smooth; in the younger leaves this border is scarcely evident or appearing only as a paler margin; costa percurrent, papillose on the back, in cross-section showing about four guide-cells with a row of three or four cells of about equal size on ventral side and on dorsal side a large stereid band with outer cells differentiated; cells of upper part of leaf mostly very obscure with minute, often C-shaped papillae, the median cells not elongate, somewhat four-sided, about $8\ \mu$ in diameter, those in the border about one half way down mostly elongate; the cells of lower one third of leaf pale, smooth, shortly rectangular or elongate-hexagonal; perichaetial leaves slightly differenti-

ated; seta erect, mostly 7–10 mm., rarely 13 mm. long; capsule erect, nearly straight and cylindric, about 2 mm. long without lid, with a conical more or less short-beaked lid 0.50–0.75 mm. long, the cells from a little above the base mostly oblong in slightly oblique rows; annulus large, persistent, of two or three rows of cells; peristome papillose, reddish or golden brown, the erect or nearly erect teeth from a basal membrane projecting a little above the annulus and irregularly divided into two or three forks, or the forks sometimes more or less united; spores smooth, about 8μ in diameter; calyptra cucullate, long-beaked, extending one third way down the capsule. [FIG. 6.]

TYPE LOCALITY: Easton, Pennsylvania.

DISTRIBUTION: Gaspé coast, Quebec, and Point Pelee Island, Lake Erie, Ontario, to Pennsylvania, Ohio and Illinois.

EXSICCATAE: Aust. Musci App. 123.

ILLUSTRATION: Sull. Ic. Musc. Suppl. *pl.* 23.

7. DESMATODON SYSTILIUS B.S.G. Bryol. Eur. (18–20): Desmatodon, Suppl. 1. 1. 1843

Paroicous, the antheridia about 0.25 mm. long, in one or two pairs, without paraphyses, in the axils of the outer perichaetial leaves: plants caespitose, somewhat branching, usually 2–3 mm. high, often more or less bud-like; the upper stem leaves with blade about 1.5 mm. long and 1 mm. wide, broadly ovate, acute, the margins mostly flat and entire or slightly crenulate at apex and the costa excurrent into a nearly smooth, flexuous, hair-point of variable length; the costa in cross-section showing two guide-cells with two often larger cells on the ventral side and on the dorsal side a large stereid band with differentiated outer cells; cells of upper part of leaf from nearly square to rhomboidal or hexagonal, somewhat mamilllose, the median $15\text{--}20\mu$ in diameter, in lower part mostly rather larger and elongate-hexagonal or short-rectangular; perichaetial leaves scarcely differentiated; seta erect, about 8 mm. long; capsule erect, oblong-cylindric, up to 2 mm. long without lid, the columella exerted, persistent, the stomata in about two rows near base; annulus persistent, of one or two rows of cells; peristome teeth reddish brown, papillose, mostly divided to near the base into two forks, erect from a rather low basal membrane; lid remaining more or less attached to the columella after separating from the annulus, obliquely short-beaked, the cells, except the three of four basal rows, elongate, in slightly oblique rows; calyptra cucullate, descending well down the capsule; spores rough, up to 25μ in diameter. [FIG. 7.]

TYPE LOCALITY: Norway.

DISTRIBUTION: Greenland and Newfoundland to the Canadian Rocky Mountains and at the foot of Mount Dana, California; also in Europe.

ILLUSTRATION: B.S.G. Bryol. Eur. *pl.* 131.

8. DESMATODON GARBERI Lesq. & James, Man. 112. 1884

Hyophila fragilis Card. Rev. Bryol. 36: 75. 1909.

Dioicous, the male plants very slender, with a rosette-like apical flower, the outer perigonal leaves scarcely differentiated, the inner shorter, ovate-acute, entire, costate, enclosing ten to fifteen antheridia about 0.3 mm. long, with filiform, somewhat longer paraphyses: fertile plants in compact cushions with slender, erect, mostly unbranched stems 5–6 mm. high and about 0.2 mm. in diameter with distinct central strand and few or no radicles above the base; stem leaves rather distant, incurved or somewhat crispate and subtubulose when dry, the upper 1–1.5 mm. long, oblong-lanceolate, acute, with margins incurved and entire or occasionally with a few small teeth near the apex, flat and entire below; costa stout, sometimes rough on the back in the upper part, percurrent, in cross-section showing two to four guide-cells with one or two rows of smaller cells on the ventral side and on the dorsal side a large stereid band with outer cells scarcely differentiated; cells of leaf distinct, more or less golden brown from apex to base of leaf, those of upper part highly mamillate on the ventral side, mostly nearly flat on the dorsal side, the median cells roundish, about 8μ in diameter, the basal smooth and rather short-rectangular; perichaetial leaves scarcely differentiated or sometimes one or two very small inner leaves; seta erect, 5 mm. long; capsule somewhat fusiform, its greatest diameter a little below the middle, 1–1.3 mm. long without lid, the stomata in one row near the base; annulus of one or two rows of cells; teeth of peristome reddish brown, papillose, irregular, divided often nearly to base into two slender forks, from a papillose basilar membrane scarcely extending above the rim of capsule; lid nearly erect, conical, short-beaked, about one third the length of the capsule, the cells elongate in nearly erect rows; spores smooth, 6–8 μ in diameter, calyptra cucullate, extending well down the capsule, sometimes split upward to near the smooth apex. [FIG. 8.]

TYPE LOCALITY: Key West, Florida.

DISTRIBUTION: New Providence, Bahama Islands; Key West, Florida; and Yucatan, Mexico.

The specimens of *Hyophila fragilis* are not fruiting but they do not seem to differ from *D. Garberi* except perhaps in being a little more slender.

9. **Desmatodon Sprengelii** (Schwaegr.) comb. nov.

Barbula Sprengelii Schwaegr. Suppl. 2¹: 64. 1823.

Plaubelia tortuosa Brid. Bryol. Univ. 1: 522. 1826.

Weisia Berteriana Spreng. Syst. Veg. 4: 156. 1827.

Dioicous, the male flower terminal, the short, inner antheridial leaves closely surrounding about six large antheridia, one third mm. long, with few, filiform paraphyses: fertile plants low, in dusky green cushions with simple, slender stems mostly 4–5 mm. long; leaves on the stem below rather distant, gradually and slightly larger and more crowded toward the apex, incurved when dry, widely spreading when moist, the upper about 1 mm. long, oblong linear, with broad, somewhat rounded or broadly acute, slightly apiculate and serrulate apex, the margins from a little below the apex to the middle of leaf or farther, incurved and entire; costa stout, often slightly rough on the back near the apex and the ventral surface more or less mamilllose, vanishing two or three cells below the apex of the leaf, in cross-section showing two or three guide-cells with an equal number of somewhat smaller cells on the ventral side and on the dorsal side a stereid band with outer cells differentiated; cells of upper part of leaf distinct, roundish-hexagonal, 6–7 μ in diameter, mamilllose on the upper side, flat or nearly so on the under side, in about the lower fourth of leaf becoming square to short rectangular with colored, slightly thickened walls as in cells of upper leaf; perichaetial leaves mostly a little longer than those of the stem with a somewhat broader, loosely clasping base rather gradually narrowed to a not quite entire, more acute point; seta erect, about 4 mm. long; capsule erect, somewhat fusiform, about 1.5 mm. long without lid, the exothecal cells rather irregular, two to four times longer than broad, with thin walls, the stomata few, near the base; peristome reddish brown, the basal membrane extending about the height of the annulus above the rim, with 16 erect, quite irregular, finely papillose teeth of variable length either undivided or more or less divided along the median line; lid somewhat obliquely subulate, about two thirds the length of the rest of the capsule; spores about 8 μ in diameter, pale and smooth; calyptra cucullate, extending about half way down the capsule. [FIG. 9.]

TYPE LOCALITY: Hispaniola (Santo Domingo).

DISTRIBUTION: known only from Santo Domingo and Florida (Cape Sable, 1916, *J. K. Small*).

10. *Desmatodon stomatodontus* (Card.) comb. nov.

Hyophila stomatodonta Card. Rev. Bryol. 36: 76. 1909.

Dioicous: plants with slender stems 4–8 mm. long; lower leaves minute, the larger crowded into a rosulate tuft at the apex of the stem, somewhat spatulate-oblong, flexuous with strongly inrolled margins when dry, more or less widely spreading when moist, about 1.5 mm. long, mostly obtuse and scarcely apiculate, the margins finely crenulate to below the middle; costa percurrent, 40 μ wide a little above the base, in cross-section showing two large guide-cells, three to four rather large cells above them and below a large stereid band with the outer cells differentiated; cells in upper part of leaf distinct, roundish to hexagonal, mamilllose on both sides, 6–8 μ in diameter, in the lower leaf, square to short-rectangular and scarcely paler than above; one or two inner perichaetial leaves sometimes lanceolate, acute, with the costa scarcely percurrent; seta about 5 mm. long; capsule erect, cylindric, about 1.5 mm. long without lid, the exothecal cells mostly irregularly elongate, with thin walls, the median cells about 20 μ wide by 40–50 μ long; lid about one-half the length of the capsule, nearly erect, with cells a little above its base elongate in nearly erect rows; annulus large; peristome reddish brown, papillose, fragile, irregularly divided from some distance above the rim into slender forks extending about 150 μ above the rim; spores smooth, pale, 7–8 μ in diameter. [FIG. 10.]

TYPE LOCALITY: State of Jalisco, Mexico.

DISTRIBUTION: known only from type locality.

11. *Desmatodon cernuus* (Hueb.) B.S.G. Bryol. Eur. (18–20):
Desmatodon 8. 1843

Dermatodon cernuus Hueb. Musc. Germ. 117. 1833.

Cynodontium latifolium Schwaegr. Suppl. 1¹: 110. 1817 (not *Dicranum latifolium* Hedw. Desc. 1: 89. 1787).

Desmatodon camptothecius Kindb.; Macoun, Cat. Can. Pl. 6: 48. 1892.

Dermatodon camptothecius Kindb. Eur. & N. Am. Bryin. 2: 283. 1897.

Autoicous, the male flower just below the perichaetium, composed of several club-shaped, often long-stalked antheridia, with rather numerous, slightly club-shaped paraphyses, enclosed by two ovate-lanceolate, costate leaves about 1 mm. long, either entire or with one or two rather large teeth at the acute apex: plants in compact cushions with mostly simple stems from 3–4

mm. up to 2 cm. high; stem leaves more or less erect or flexuous and twisted when dry, from oblong-linear to oblong-spatulate, up to 3.5 mm. long by 1 mm. wide, acute, the margins toward apex flat and mostly not quite entire, of a single layer of cells, farther down more or less revolute on one or both sides and usually of a double layer of two to four rows of slightly colored cells; costa smooth on the back, mostly excurrent into a short awn, in cross-section showing two guide-cells, a single row of about three cells nearly as large on the ventral side and on the dorsal side a stereid band with the outer cells differentiated; cells of upper part somewhat rhomboidal to hexagonal, up to $20\ \mu$ wide by $25\ \mu$ long, rarely smooth or nearly so but mostly papillose on both sides; cells of lower part smooth, lax, pale, up to $30\ \mu$ wide by $140\ \mu$ long; perichaetial leaves scarcely differentiated; seta erect, 1.5–2 cm. long, yellow or finally reddish; capsule nodding to horizontal, somewhat curved-ovate, the mouth rather small and oblique, the few stomata in one row at the base; peristome reddish brown, densely papillose, the teeth mostly divided irregularly into two forks, one or both of which are more or less perforate or split in the lower part, the basilar membrane extending well above the rim; annulus persistent, of one to three rows of rather small cells; lid obliquely short-pointed, its height slightly exceeding its basal diameter, the cells in erect rows and scarcely elongate except in the point; calyptra cucullate, rather small, the apex smooth and dark colored; spores papillose, $30\text{--}50\ \mu$ in diameter. [FIG. 11.]

TYPE LOCALITY: Tyrol, Austria.

DISTRIBUTION: Gaspé coast, Quebec, to the Yukon River, and southward to Colorado.

EXSICCATAE: Macoun, Can. Musci 71, 604.

ILLUSTRATIONS: Schwaegr. Suppl. 1¹: pl. 28; B.S.G. Bryol. Eur. pl. 134.

12. DESMATODON LAURERI (Schultz) B.S.G. Bryol. Eur. (18–20): Desmatodon 9. 1843

Trichostomum Laureri Schultz, Flora 10: 163. 1827.

Tortula bryoides Hook. in Drummond, Musci Am. 135. 1828.

Autoicous, the male flower sessile just below the perichaetium, of eight or ten more or less stalked antheridia about 0.5 mm. long, with abundant, often longer, club-shaped paraphyses, enclosed by two or three ovate, entire, somewhat acute leaves, with the costa vanishing just below the apex: plants in compact tufts from a few millimeters to 2 cm. high, with somewhat branching stems more or less tomentose below; the lower stem leaves ovate, the upper longer, more or less erect-flexuous and twisted when dry, nearly

linear, the base often a little broader, 4 mm. long and 1 mm. wide, rarely 5.5 mm. long and 1.5 mm. wide, the point rounded or broadly acute and mostly apiculate by the shortly excurrent costa; leaf-margin, except near the flat and not quite entire apex, with a distinct, thickened and recurved border extending to near the base; costa papillose on the back to below the middle, in cross-section showing two or three guide-cells, usually a single layer of large cells on ventral side, but sometimes two layers, and on dorsal side a large stereid band with outer cells somewhat differentiated; cells of upper part finely papillose on both sides, rhomboidal to hexagonal, the median about $16\ \mu$ wide by $18\text{--}25\ \mu$ long, the basal cells, often $20\ \mu$ wide by $50\text{--}80\ \mu$ long, smooth and more or less tinged with golden brown: perichaetial leaves scarcely differentiated; seta somewhat flexuous, 8–15 mm. long; capsule nodding to horizontal, sometimes pendant, oblong, more or less curved, up to 2 mm. long without lid, the stomata in one row at the base; peristome reddish brown, the distantly articulate teeth often twisted almost once around and divided nearly to the base into two or three slender, terete, sometimes split or perforate forks or the forks sometimes united above; annulus persistent, of two or three rows of small cells; lid conic, short-pointed, the three or four basal rows of cells not elongate, those above elongate-rectangular, in very oblique rows; calyptra cucullate, extending about one half way down the capsule; spores papillose, $30\text{--}40\ \mu$ in diameter. [FIG. 12.]

TYPE LOCALITY: Tyrol, Austria.

DISTRIBUTION: Rocky Mountains of British America and Vancouver Island to Colorado; also in Greenland, Europe and Asia.

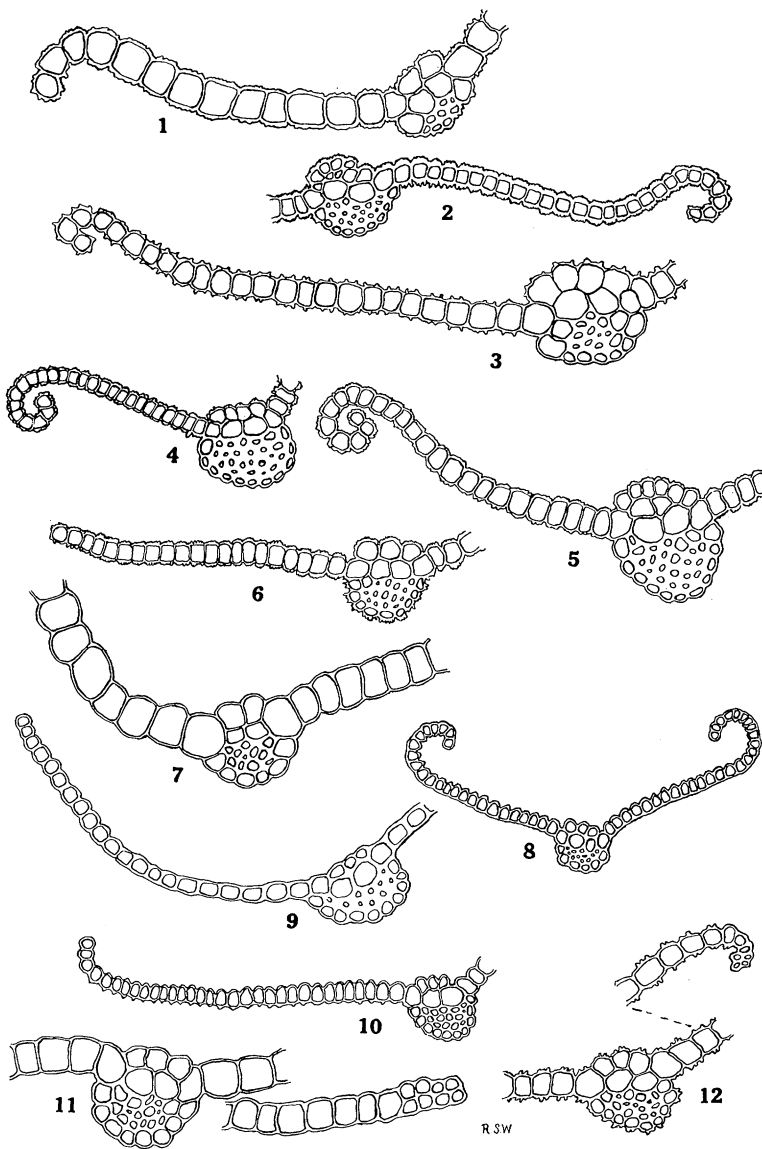
EXSICCATAE: Drummond, Musci Am. 135.

ILLUSTRATION: B.S.G. Bryol. Eur. pl. 135.

Explanation of plate 11

Cross-sections of *Desmatodon* made about half way down the leaf.

- FIG. 1. *Desmatodon latifolius* (Hedw.) Brid., from California, $\times 270$.
- FIG. 2. *Desmatodon suberectus* (Hook.) Limpr., from Canada, $\times 270$.
- FIG. 3. *Desmatodon Guepini* B. S. G., from California, $\times 270$.
- FIG. 4. *Desmatodon plinthobius* Sull. & Lesq., from South Carolina, $\times 270$.
- FIG. 5. *Desmatodon obtusifolius* (Schwaegr.) Jur., from Montana, $\times 270$.
- FIG. 6. *Desmatodon Porteri* James., from Pennsylvania, $\times 200$.
- FIG. 7. *Desmatodon systylius* B. S. G., from Labrador, $\times 270$.
- FIG. 8. *Desmatodon Garberi* Lesq. & James, from Florida, $\times 270$.
- FIG. 9. *Desmatodon Sprengelii* (Schwaegr.) R. S. Williams, from Santo Domingo, $\times 270$.
- FIG. 10. *Desmatodon stomatodontus* (Card.) R. S. Williams, from Mexico, $\times 350$.
- FIG. 11. *Desmatodon cernuus* (Hueb.) B. S. G., from Canada, $\times 270$.
- FIG. 12. *Desmatodon Laureri* (Schultz) B. S. G., from Colorado, $\times 270$.



R S W

WILLIAMS : DESMATODON